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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,177

12/04/2006

Gerhard Domberger

4100-418PUS

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27799

7590

05/27/2009

COHEN, PONTANI, LIEBERMAN & PAVANE LLP

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SUITE 1210

NEW YORK, NY 10176

EXAMINER

HAMO, PATRICK

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

05/27/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,177	<b>Applicant(s)</b> DOMBERGER, GERHARD	
	<b>Examiner</b> PATRICK HAMO	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>15 Sep 2006</u>   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to because the lines, numbers, and letters are not uniformly thick and well-defined as required by 37 CFR 1.84(l). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al., US 2003/0219346.

In regard to claim 4:

Abe teaches a unit for a high pressure pump comprising:

a housing 1 defining a pump cylinder 20;

a piston 2 arranged in said pump cylinder and having a first end (toward the top of fig. 1) defining a head region of said piston and a second end opposing said first end;

a controlled drive 100 acting on said second end of said piston configured to oscillate said piston in said cylinder through a suction stroke and a compression stroke; a conveying flow inlet 5 connected to said cylinder; and a conveying valve 6, wherein a fluid is drawn into said cylinder through said conveying flow inlet during the suction stroke and a pressure of the fluid in said cylinder is increased during the compression stroke for feeding the fluid through said conveying valve (see paragraph 0027), and

wherein said piston comprises a first centering truncated cone at said head region comprising a truncated cone having a circular base area and a top area (see top of piston 2 in fig. 1).

In regard to the limitation that a ratio of a maximum half diameter reduction of said first centering cone with respect to the diameter of said piston is approximately

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1:200 and a ratio of the axial length of said first centering cone to the length of said piston is approximately 1:6.6, it is not patentable to claim a numerical value for a ratio of these measurements unless there is evidence that the ratio is critical. See *In re Hoeschele*, 406 F.2d 1403 (CCPA 1969) (claimed elastomeric polyurethanes which fell within the broad scope of the references were held to be unpatentable thereover because, among other reasons, there was no evidence of the criticality of the claimed ranges of molecular weight or molar proportions.). In the presently claimed invention, it is the examiner's interpretation that the claimed ratios are, at best, ratios for achieving the optimum effect of reducing the wear on the piston and the sealing rings and bearings. There is no indication that the ratio is not critical to achieving the effect in the first place.

In regard to claim 6:

Abe's unit is a fuel injector for a common rail 53 fuel injection system for an internal combustion engine, and the drive 100 is a connected to a camshaft and a spring 4.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe in view of Olav et al., DE 10045281.

Abe discloses all of the limitations of claims 4 and 6 substantially as discussed above. However, Abe is not explicit in the discussion of the reason for providing a truncated cone top for the piston, such that the limitations to the ratio of the truncated

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region to the rest of the piston must be inferred. Olav, on the other hand, teaches a piston/cylinder for high pressure operation that includes a truncated piston head (see figs. 1-3, top end of piston 6) that reduces the diameter of the piston head 7 to control spacing with a compression cavity corresponding to the degree of heat input to the piston 6 (see Abstract). It would have been obvious to one of ordinary skill in the art to apply this heat dissipation teaching of Olav to the high pressure common rail fuel system of Abe. In regard to the limitation that a ratio of a maximum half diameter reduction of said first centering cone with respect to the diameter of said piston is approximately 1:200 and a ratio of the axial length of said first centering cone to the length of said piston is approximately 1:6.6, the discussion above still applies, as it would have been obvious to one skilled in the art that the reduction in diameter, being dependent on expected heat input to the piston, may be varied to fall within the ratio ranges claimed, and that this would constitute routine experimentation to determine.

In regard to claim 5:

Olav's piston further comprises a step between the top of the piston and the truncated cone (see fig. 1). It would have been obvious to one having ordinary skill in the art that this region could be beveled, and that a distance between a center axis of said first centering cone and a center axis of said second centering cone would be substantially zero as they are both centered around the same point (center of the piston). The claimed limitation of a maximum tolerance of 1 micron would be an

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obvious matter of engineering design choice, as smaller tolerances are always preferred within the cost constraints of machining such fine tolerances.

In regard to claim 6:

Abe's unit is a fuel injector for a common rail 53 fuel injection system for an internal combustion engine, and the drive 100 is a connected to a camshaft and a spring 4.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Charles G Freay/  
Primary Examiner, Art Unit 3746

/Patrick Hamo/  
Patent Examiner, AU 3746